What Is Claimed Is:

1. A method for separating and purifying a nucleic acid having a predetermined length from a nucleic acid mixture, comprising a step of:

adsorbing and desorbing a nucleic acid in the nucleic acid mixture containing nucleic acids having different lengths to and from a solid phase of an organic macromolecule having a hydroxyl group on surface thereof.

2. The method according to claim 1, wherein the organic macromolecule having a hydroxyl group on surface thereof is surface-saponified acetylcellulose.

3. The method according to claim 1, wherein the organic macromolecule having a hydroxyl groups on surface thereof is surface-saponified triacetylcellulose.

4. The method according to claim 2, wherein the surface-saponification rate of acetylcellulose is 5% or higher.

5. The method according to claim 2, wherein the surface-saponification rate of acetylcellulose is 10% or higher.

6. The method according to claim 2, wherein acetylcellulose is a porous film.

7. The method according to claim 2, wherein acetylcellulose is a non-porous film.

8. The method according to claim 1, wherein a porous film of a surface-saponified acetylcellulose is used as the solid phase, and a nucleic acid having a predetermined length is separated and purified by selecting a surface-saponification rate of acetylcellulose and a pore size of the porous film.

9. The method according to claim 8, wherein the surface-saponification rate of acetylcellulose is 10 to 100% and the pore size of the porous film is 0.1 μm to 10 μm.

10. The method according to claim 2, wherein acetylcellulose is coated on beads.

11. The method according to claim 1, wherein the nucleic acid in a sample solution containing nucleic acids having different lengths is adsorbed to and desorbed from the solid

phase of organic macromolecule having a hydroxyl group on surface thereof.

12. The method according to claim 11, wherein the sample solution is a solution prepared by adding a water-soluble organic solvent to a solution obtained by treating a cell- or virus-containing test sample with a nucleic acid-solubilizing reagent.

13. The method according to claim 12, wherein the nucleic acid-solubilizing reagent is a guanidine salt, a surfactant and a proteolytic enzyme.

14. The method according to claim 1, comprising steps of:

adsorbing the nucleic acid to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof;

washing the solid phase using a nucleic acid-washing buffer; and

desorbing the nucleic acid adsorbed to the solid phase by using a liquid capable of desorbing the nucleic acid adsorbed to the solid phase.

15. The method according to claim 14, wherein the nucleic acid-washing buffer is a solution containing 20 to 100 % by weight of methanol, ethanol, isopropanol or n-propanol.

16. The method according to claim 14, wherein the liquid capable of desorbing the nucleic acid adsorbed to the solid phase is a solution having a salt concentration of 0.5 M or lower.

17. The method according to claim 1, wherein adsorption and desorption of the nucleic acid is carried out by using an unit for separation and purification of nucleic acid in which a container having at least two openings contains the solid phase of the organic macromolecule having a hydroxyl group on surface thereof.

18. The method according to claim 1, wherein adsorption and desorption of the nucleic acid is carried out by using an unit for separation and purification of nucleic acid which comprises (a) a solid phase of the organic macromolecule having a hydroxyl group on surface thereof, (b) a container having at

least two openings and containing the solid phase, and (c) a pressure difference-g n rating apparatus connected to one opening of the container.

19. The method according to claim 18, comprising steps of:

(a) preparing a sample solution containing a nucleic acid by using a test sample and inserting one opening of an unit for separation and purification of nucleic acid into said sample solution containing the nucleic acid;

(b) sucking the sample solution containing the nucleic acid by making an inside of the container in a reduced pressure condition by using the pressure difference-generating apparatus connected to the other opening of the unit for separation and purification of nucleic acid, and contacting the sample solution to a solid phase of the organic macromolecule having a hydroxyl group on surface thereof;

(c) making the inside of the container in a pressurized condition by using the pressure difference-generating apparatus connected to the other opening of the unit for separation and purification of nucleic acid, and discharging the sample solution containing the sucked nucleic acid to an outside of the container;

(d) inserting one opening of the unit for separation and purification of nucleic acid into the nucleic acid-washing buffer;

(e) sucking the nucleic acid-washing buffer by making the inside of the container in the reduced pressure condition by using the pressure difference-generating apparatus connected to the other opening of the unit for separation and purification of nucleic acid, and contacting the nucleic acid-washing buffer to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof;

(f) making the inside of the container in the pressurized condition by using the pressure difference-generating apparatus connected to the other opening of the unit for separation and purification of nucleic acid, and discharging

the sucked nucleic acid-washing buffer to th outside of the container;

(g) inserting one opening of the unit for separation and purification of nucleic acid into the liquid capable of desorbing the nucleic acid adsorbed to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof;

(h) making the inside of the container in the reduced pressure condition by using the pressure difference-generating apparatus connected to the other opening of the unit for separation and purification of nucleic acid, and sucking the liquid capable of desorbing the nucleic acid adsorbed to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof to contact the liquid to the solid phase; and

(i) making the inside of the container in the pressurized condition by using the pressure difference-generating apparatus connected to the other opening of the unit for separation and purification of nucleic acid, and discharging the liquid capable of desorbing the nucleic acid adsorbed to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof to the outside of the container.

20. The method according to claim 18, comprising steps of:

(a) preparing a sample solution containing the nucleic acid using a test sample and injecting said sample solution containing the nucleic acid into one opening of the unit for separation and purification of nucleic acid;

(b) making the inside of the container in the pressurized condition by using the pressure difference-generating apparatus connected to said one opening of the unit for separation and purification of nucleic acid, and discharging the injected sample solution containing the nucleic acid from the other opening to contact the sample solution to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof;

(c) injecting the nucl ic acid-washing buffer into said one opening of the unit for separation and purification of nucleic acid;

(d) making the inside of the container in the pressurized condition by using the pressure difference-generating apparatus connected to said one opening of the unit for separation and purification of nucleic acid, and discharging the injected nucleic acid-washing buffer from said other opening to contact the nucleic acid-washing buffer to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof;

(e) injecting the liquid capable of desorbing the nucleic acid adsorbed to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof into said one opening of the unit for separation and purification of nucleic acid; and

(f) making the inside of the container in the pressurized condition by using the pressure difference-generating apparatus connected to said one opening of the unit for separation and purification of nucleic acid, and discharging the liquid capable of desorbing the injected nucleic acid from said other opening, so as to desorb the nucleic acid adsorbed to the solid phase of the organic macromolecule having a hydroxyl group on surface thereof and discharge the nucleic acid to the outside of the container.